

***N(1720) 3/2<sup>+</sup>*** $I(J^P) = \frac{1}{2}(\frac{3}{2}^+)$  Status: \*\*\*

Most of the results published before 1975 were last included in our 1982 edition, Physics Letters **111B** 1 (1982). Some further obsolete results published before 1984 were last included in our 2006 edition, Journal of Physics, G **33** 1 (2006).

NODE=B015

***N(1720) BREIT-WIGNER MASS***

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>1700 to 1750 (<math>\approx</math> 1720) OUR ESTIMATE</b>			
1690 $\pm$ 70 - 35	ANISOVICH	12A	DPWA Multichannel
1763.8 $\pm$ 4.6	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
1700 $\pm$ 50	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
1710 $\pm$ 20	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1720 $\pm$ 5	SHRESTHA	12A	DPWA Multichannel
1770 $\pm$ 100	ANISOVICH	10	DPWA Multichannel
1720 $\pm$ 18	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
1790 $\pm$ 100	THOMA	08	DPWA Multichannel
1749.6 $\pm$ 4.5	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
1705 $\pm$ 10	PENNER	02C	DPWA Multichannel
1716 $\pm$ 112	VRANA	00	DPWA Multichannel
1713 $\pm$ 10	ARNDT	96	IPWA $\gamma N \rightarrow \pi N$
1820	ARNDT	95	IPWA $\pi N \rightarrow N\pi$
1720	LI	93	IPWA $\gamma N \rightarrow \pi N$
1717 $\pm$ 31	MANLEY	92	IPWA $\pi N \rightarrow \pi N & N\pi\pi$
1690	SAXON	80	DPWA $\pi^- p \rightarrow \Lambda K^0$
1750	<sup>1</sup> LONGACRE	77	IPWA $\pi N \rightarrow N\pi\pi$
1720	<sup>2</sup> LONGACRE	75	IPWA $\pi N \rightarrow N\pi\pi$

NODE=B015M

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→ UNCHECKED ←

***N(1720) BREIT-WIGNER WIDTH***

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>150 to 400 (<math>\approx</math> 250) OUR ESTIMATE</b>			
420 $\pm$ 100	ANISOVICH	12A	DPWA Multichannel
210 $\pm$ 22	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
125 $\pm$ 70	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$
190 $\pm$ 30	HOEHLER	79	IPWA $\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
200 $\pm$ 20	SHRESTHA	12A	DPWA Multichannel
650 $\pm$ 120	ANISOVICH	10	DPWA Multichannel
244 $\pm$ 28	BATINIC	10	DPWA $\pi N \rightarrow N\pi, N\eta$
690 $\pm$ 100	THOMA	08	DPWA Multichannel
256 $\pm$ 22	ARNDT	04	DPWA $\pi N \rightarrow \pi N, \eta N$
237 $\pm$ 73	PENNER	02C	DPWA Multichannel
121 $\pm$ 39	VRANA	00	DPWA Multichannel
153 $\pm$ 15	ARNDT	96	IPWA $\gamma N \rightarrow \pi N$
354	ARNDT	95	IPWA $\pi N \rightarrow N\pi$
200	LI	93	IPWA $\gamma N \rightarrow \pi N$
380 $\pm$ 180	MANLEY	92	IPWA $\pi N \rightarrow \pi N & N\pi\pi$
120	SAXON	80	DPWA $\pi^- p \rightarrow \Lambda K^0$
130	<sup>1</sup> LONGACRE	77	IPWA $\pi N \rightarrow N\pi\pi$
150	<sup>2</sup> LONGACRE	75	IPWA $\pi N \rightarrow N\pi\pi$

NODE=B015W

NODE=B015W

→ UNCHECKED ←

***N(1720) POLE POSITION***

REAL PART VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>1660 to 1690 (<math>\approx</math> 1675) OUR ESTIMATE</b>			
1660 $\pm$ 30	ANISOVICH	12A	DPWA Multichannel
1666	ARNDT	06	DPWA $\pi N \rightarrow \pi N, \eta N$
1686	<sup>3</sup> HOEHLER	93	SPED $\pi N \rightarrow \pi N$
1680 $\pm$ 30	CUTKOSKY	80	IPWA $\pi N \rightarrow \pi N$

NODE=B015215

NODE=B015RE

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→ UNCHECKED ←

• • • We do not use the following data for averages, fits, limits, etc. • • •

1687	SHRESTHA	12A	DPWA	Multichannel
1660±35	ANISOVICH	10	DPWA	Multichannel
1691±23	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
1630±90	THOMA	08	DPWA	Multichannel
1655	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
1692	VRANA	00	DPWA	Multichannel
1717	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
1675	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90
1716 or 1716	<sup>4</sup> LONGACRE	78	IPWA	$\pi N \rightarrow N\pi\pi$
1745 or 1748	<sup>1</sup> LONGACRE	77	IPWA	$\pi N \rightarrow N\pi\pi$

### -2xIMAGINARY PART

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT	
<b>150 to 400 (<math>\approx 250</math>) OUR ESTIMATE</b>				
450±100	ANISOVICH	12A	DPWA	Multichannel
355	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
187	<sup>3</sup> HOEHLER	93	SPED	$\pi N \rightarrow \pi N$
120± 40	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
175	SHRESTHA	12A	DPWA	Multichannel
360± 80	ANISOVICH	10	DPWA	Multichannel
233± 23	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
460± 80	THOMA	08	DPWA	Multichannel
278	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
94	VRANA	00	DPWA	Multichannel
388	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
114	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90
124 or 126	<sup>4</sup> LONGACRE	78	IPWA	$\pi N \rightarrow N\pi\pi$
135 or 123	<sup>1</sup> LONGACRE	77	IPWA	$\pi N \rightarrow N\pi\pi$

NODE=B015IM

NODE=B015IM

→ UNCHECKED ←

### N(1720) ELASTIC POLE RESIDUE

#### MODULUS | $r$ |

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT	
<b>15±8 OUR ESTIMATE</b>				
22±8	ANISOVICH	12A	DPWA	Multichannel
25	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
15	HOEHLER	93	SPED	$\pi N \rightarrow \pi N$
8±2	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
20	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
20	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
39	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
11	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

NODE=B015220

NODE=B015RER

NODE=B015RER

→ UNCHECKED ←

#### PHASE $\theta$

VALUE (°)	DOCUMENT ID	TECN	COMMENT	
<b>-130±30 OUR ESTIMATE</b>				
-115±30	ANISOVICH	12A	DPWA	Multichannel
- 94	ARNDT	06	DPWA	$\pi N \rightarrow \pi N, \eta N$
-160±30	CUTKOSKY	80	IPWA	$\pi N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
-109	BATINIC	10	DPWA	$\pi N \rightarrow N\pi, N\eta$
- 88	ARNDT	04	DPWA	$\pi N \rightarrow \pi N, \eta N$
- 70	ARNDT	95	DPWA	$\pi N \rightarrow N\pi$
-130	ARNDT	91	DPWA	$\pi N \rightarrow \pi N$ Soln SM90

NODE=B015IMR

NODE=B015IMR

→ UNCHECKED ←

### N(1720) INELASTIC POLE RESIDUE

The "normalized residue" is the residue divided by  $\Gamma_{pole}/2$ .

#### Normalized residue in $N\pi \rightarrow N(1720) \rightarrow N\eta$

MODULUS (%)	DOCUMENT ID	TECN	COMMENT	
3±2	ANISOVICH	12A	DPWA	Multichannel

NODE=B015250

NODE=B015250

NODE=B015RS1

NODE=B015RS1

**Normalized residue in  $N\pi \rightarrow N(1720) \rightarrow \Lambda K$** 

<u>MODULUS (%)</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>6±4</b>	<b>-150 ± 45</b>	ANISOVICH	12A DPWA	Multichannel

NODE=B015RS2

NODE=B015RS2

**Normalized residue in  $N\pi \rightarrow N(1720) \rightarrow \Delta\pi, P\text{-wave}$** 

<u>MODULUS (%)</u>	<u>PHASE (°)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>29±8</b>	<b>80 ± 40</b>	ANISOVICH	12A DPWA	Multichannel

NODE=B015RS3

NODE=B015RS3

**Normalized residue in  $N\pi \rightarrow N(1720) \rightarrow \Delta\pi, F\text{-wave}$** 

<u>MODULUS (%)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>3±3</b>	ANISOVICH	12A DPWA	Multichannel

NODE=B015RS4

NODE=B015RS4

 **$N(1720)$  DECAY MODES**

The following branching fractions are our estimates, not fits or averages.

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 N\pi$	(11± 3) %
$\Gamma_2 N\eta$	( 4± 1) %
$\Gamma_3 \Lambda K$	1–15 %
$\Gamma_4 \Sigma K$	
$\Gamma_5 N\pi\pi$	>70 %
$\Gamma_6 \Delta\pi$	
$\Gamma_7 \Delta(1232)\pi, P\text{-wave}$	(75±15) %
$\Gamma_8 N\rho$	70–85 %
$\Gamma_9 N\rho, S=1/2, P\text{-wave}$	large
$\Gamma_{10} N\rho, S=3/2, P\text{-wave}$	
$\Gamma_{11} N(\pi\pi)_{S\text{-wave}}^{I=0}$	
$\Gamma_{12} p\gamma$	0.05–0.25 %
$\Gamma_{13} p\gamma, \text{ helicity}=1/2$	0.05–0.15 %
$\Gamma_{14} p\gamma, \text{ helicity}=3/2$	0.002–0.16 %
$\Gamma_{15} n\gamma$	0.0–0.016 %
$\Gamma_{16} n\gamma, \text{ helicity}=1/2$	0.0–0.01 %
$\Gamma_{17} n\gamma, \text{ helicity}=3/2$	0.0–0.015 %

NODE=B015225;NODE=B015

NODE=B015

 **$N(1720)$  BRANCHING RATIOS** **$\Gamma(N\pi)/\Gamma_{\text{total}}$** **11 ±3 OUR ESTIMATE**

10 ±5

9.4±0.5

10 ±4

14 ±3

• • • We do not use the following data for averages, fits, limits, etc. • • •

13.6±0.6

14 ±5

18 ±3

9 ±6

19.0±0.4

17 ±2

5 ±5

16

13 ±5

 **$\Gamma_1/\Gamma$** 

<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
ANISOVICH	12A DPWA	Multichannel
ARNDT	06 DPWA	$\pi N \rightarrow \pi N, \eta N$
CUTKOSKY	80 IPWA	$\pi N \rightarrow \pi N$
HOEHLER	79 IPWA	$\pi N \rightarrow \pi N$
SHRESTHA	12A DPWA	Multichannel
ANISOVICH	10 DPWA	Multichannel
BATINIC	10 DPWA	$\pi N \rightarrow N\pi, N\eta$
THOMA	08 DPWA	Multichannel
ARNDT	04 DPWA	$\pi N \rightarrow \pi N, \eta N$
PENNER	02C DPWA	Multichannel
VRANA	00 DPWA	Multichannel
ARNDT	95 DPWA	$\pi N \rightarrow N\pi$
MANLEY	92 IPWA	$\pi N \rightarrow \pi N & N\pi\pi$

NODE=B015230

NODE=B015R1

NODE=B015R1

→ UNCHECKED ←

 **$\Gamma(N\eta)/\Gamma_{\text{total}}$** **3.8±0.9 OUR AVERAGE**

3 ±2

4 ±1

• • • We do not use the following data for averages, fits, limits, etc. • • •

&lt; 1

0 ±1

10 ±7

0.2±0.2

 **$\Gamma_2/\Gamma$** 

NODE=B015R11

NODE=B015R11

→ UNCHECKED ←

<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
ANISOVICH	12A DPWA	Multichannel
VRANA	00 DPWA	Multichannel
SHRESTHA	12A DPWA	Multichannel
BATINIC	10 DPWA	$\pi N \rightarrow N\pi, N\eta$
THOMA	08 DPWA	Multichannel
PENNER	02C DPWA	Multichannel

$\Gamma(\Lambda K)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma$	NODE=B015R13 NODE=B015R13
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>4.4±0.4 OUR AVERAGE</b>		
4.3±0.4	SHKLYAR 05 DPWA Multichannel	
9 ±3	PENNER 02C DPWA Multichannel	
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>		
2.8±0.4	SHRESTHA 12A DPWA Multichannel	
12 ±9	THOMA 08 DPWA Multichannel	
$\Gamma(\Delta(1232)\pi, P\text{-wave})/\Gamma_{\text{total}}$	$\Gamma_7/\Gamma$	NODE=B015R14 NODE=B015R14
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>75±15</b>		
	ANISOVICH 12A DPWA Multichannel	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}} \text{ in } N\pi \rightarrow N(1720) \rightarrow \Lambda K$	$(\Gamma_1\Gamma_3)^{1/2}/\Gamma$	NODE=B015R3 NODE=B015R3 → UNCHECKED ←
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>-0.14 to -0.06 OUR ESTIMATE</b>		
-0.09	BELL 83 DPWA $\pi^- p \rightarrow \Lambda K^0$	
-0.11	SAXON 80 DPWA $\pi^- p \rightarrow \Lambda K^0$	
Note: Signs of couplings from $\pi N \rightarrow N\pi\pi$ analyses were changed in the 1986 edition to agree with the baryon-first convention; the overall phase ambiguity is resolved by choosing a negative sign for the $\Delta(1620)$ $S_{31}$ coupling to $\Delta(1232)\pi$ .		
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}} \text{ in } N\pi \rightarrow N(1720) \rightarrow \Delta(1232)\pi, P\text{-wave}$	$(\Gamma_1\Gamma_7)^{1/2}/\Gamma$	NODE=B015310
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
-0.17	<sup>1</sup> LONGACRE 77 IPWA $\pi N \rightarrow N\pi\pi$	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}} \text{ in } N\pi \rightarrow N(1720) \rightarrow N\rho, S=1/2, P\text{-wave}$	$(\Gamma_1\Gamma_9)^{1/2}/\Gamma$	NODE=B015R6 NODE=B015R6 → UNCHECKED ←
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>-0.30 to +0.40 OUR ESTIMATE</b>		
-0.26	<sup>1</sup> LONGACRE 77 IPWA $\pi N \rightarrow N\pi\pi$	
+0.40	<sup>2</sup> LONGACRE 75 IPWA $\pi N \rightarrow N\pi\pi$	
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>		
+0.34±0.05	MANLEY 92 IPWA $\pi N \rightarrow \pi N \& N\pi\pi$	
$\Gamma(N\rho, S=1/2, P\text{-wave})/\Gamma_{\text{total}}$	$\Gamma_9/\Gamma$	NODE=B015R12 NODE=B015R12
<u>VALUE (%)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>91 ±1</b>		
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>		
1.4±0.5	SHRESTHA 12A DPWA Multichannel	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}} \text{ in } N\pi \rightarrow N(1720) \rightarrow N\rho, S=3/2, P\text{-wave}$	$(\Gamma_1\Gamma_{10})^{1/2}/\Gamma$	NODE=B015R7 NODE=B015R7
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
+0.15	<sup>1</sup> LONGACRE 77 IPWA $\pi N \rightarrow N\pi\pi$	
$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{\text{total}} \text{ in } N\pi \rightarrow N(1720) \rightarrow N(\pi\pi)_{S\text{-wave}}^{I=0}$	$(\Gamma_1\Gamma_{11})^{1/2}/\Gamma$	NODE=B015R8 NODE=B015R8
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
-0.19	<sup>1</sup> LONGACRE 77 IPWA $\pi N \rightarrow N\pi\pi$	
<b>N(1720) PHOTON DECAY AMPLITUDES</b>		
Papers on $\gamma N$ amplitudes predating 1981 may be found in our 2006 edition, Journal of Physics, G <b>33</b> 1 (2006).		
$N(1720) \rightarrow \rho\gamma, \text{ helicity-1/2 amplitude } A_{1/2}$		NODE=B015235
<u>VALUE (GeV<sup>-1/2</sup>)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
<b>-0.01 to +0.11 OUR ESTIMATE</b>		
0.110±0.045	ANISOVICH 12A DPWA Multichannel	
0.095±0.002	WORKMAN 12A DPWA $\gamma N \rightarrow N\pi$	
0.097±0.003	DUGGER 07 DPWA $\gamma N \rightarrow \pi N$	
0.044±0.066	CRAWFORD 83 IPWA $\gamma N \rightarrow \pi N$	
-0.004±0.007	AWAJI 81 DPWA $\gamma N \rightarrow \pi N$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.057±0.003	SHRESTHA	12A	DPWA	Multichannel
0.130±0.050	ANISOVICH	10	DPWA	Multichannel
0.073	DRECHSEL	07	DPWA	$\gamma N \rightarrow \pi N$
-0.053	PENNER	02D	DPWA	Multichannel
-0.015±0.015	ARNDT	96	IPWA	$\gamma N \rightarrow \pi N$
0.012±0.003	LI	93	IPWA	$\gamma N \rightarrow \pi N$

### $N(1720) \rightarrow p\gamma$ , helicity-3/2 amplitude $A_{3/2}$

VALUE ( $\text{GeV}^{-1/2}$ )	DOCUMENT ID	TECN	COMMENT
<b>-0.019±0.020 OUR ESTIMATE</b>			
0.150±0.030	ANISOVICH	12A	DPWA Multichannel
-0.048±0.002	WORKMAN	12A	DPWA $\gamma N \rightarrow N\pi$
-0.039±0.003	DUGGER	07	DPWA $\gamma N \rightarrow \pi N$
-0.024±0.006	CRAWFORD	83	IPWA $\gamma N \rightarrow \pi N$
-0.040±0.016	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.019±0.002	SHRESTHA	12A	DPWA Multichannel
0.100±0.050	ANISOVICH	10	DPWA Multichannel
-0.011	DRECHSEL	07	DPWA $\gamma N \rightarrow \pi N$
0.027	PENNER	02D	DPWA Multichannel
0.007±0.010	ARNDT	96	IPWA $\gamma N \rightarrow \pi N$
-0.022±0.003	LI	93	IPWA $\gamma N \rightarrow \pi N$

NODE=B015A2  
NODE=B015A2

→ UNCHECKED ←

### $N(1720) \rightarrow n\gamma$ , helicity-1/2 amplitude $A_{1/2}$

VALUE ( $\text{GeV}^{-1/2}$ )	DOCUMENT ID	TECN	COMMENT
<b>+0.004±0.015 OUR ESTIMATE</b>			
0.007±0.015	ARNDT	96	IPWA $\gamma N \rightarrow \pi N$
0.002±0.005	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.002±0.001	SHRESTHA	12A	DPWA Multichannel
-0.003	DRECHSEL	07	DPWA $\gamma N \rightarrow \pi N$
-0.004	PENNER	02D	DPWA Multichannel
0.050±0.004	LI	93	IPWA $\gamma N \rightarrow \pi N$

NODE=B015A3  
NODE=B015A3

→ UNCHECKED ←

### $N(1720) \rightarrow n\gamma$ , helicity-3/2 amplitude $A_{3/2}$

VALUE ( $\text{GeV}^{-1/2}$ )	DOCUMENT ID	TECN	COMMENT
<b>-0.010 to +0.020 OUR ESTIMATE</b>			
-0.005±0.025	ARNDT	96	IPWA $\gamma N \rightarrow \pi N$
-0.015±0.019	AWAJI	81	DPWA $\gamma N \rightarrow \pi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.001±0.002	SHRESTHA	12A	DPWA Multichannel
-0.031	DRECHSEL	07	DPWA $\gamma N \rightarrow \pi N$
0.003	PENNER	02D	DPWA Multichannel
-0.017±0.004	LI	93	IPWA $\gamma N \rightarrow \pi N$

NODE=B015A4  
NODE=B015A4

→ UNCHECKED ←

### $N(1720) \rightarrow \gamma p \rightarrow \Lambda K^+$ AMPLITUDES

$(\Gamma_f \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $p\gamma \rightarrow N(1720) \rightarrow \Lambda K^+$	DOCUMENT ID	TECN	$(E_{1+} \text{ amplitude})$
<u>VALUE (units <math>10^{-3}</math>)</u>			
10.2 ± 0.2	WORKMAN	90	DPWA
9.52	TANABE	89	DPWA

NODE=B015240

$p\gamma \rightarrow N(1720) \rightarrow \Lambda K^+$ phase angle $\theta$	DOCUMENT ID	TECN	$(E_{1+} \text{ amplitude})$
<u>VALUE (degrees)</u>			
-124 ± 2	WORKMAN	90	DPWA
-103.4	TANABE	89	DPWA

NODE=B015LP1  
NODE=B015LP1

$(\Gamma_f \Gamma_f)^{1/2} / \Gamma_{\text{total}}$ in $p\gamma \rightarrow N(1720) \rightarrow \Lambda K^+$	DOCUMENT ID	TECN	$(M_{1+} \text{ amplitude})$
<u>VALUE (units <math>10^{-3}</math>)</u>			
-4.5 ± 0.2	WORKMAN	90	DPWA
3.18	TANABE	89	DPWA

NODE=B015LK2  
NODE=B015LK2

## N(1720) FOOTNOTES

- <sup>1</sup> LONGACRE 77 pole positions are from a search for poles in the unitarized T-matrix; the first (second) value uses, in addition to  $\pi N \rightarrow N\pi\pi$  data, elastic amplitudes from a Saclay (CERN) partial-wave analysis. The other LONGACRE 77 values are from eyeball fits with Breit-Wigner circles to the T-matrix amplitudes.
- <sup>2</sup> From method II of LONGACRE 75: eyeball fits with Breit-Wigner circles to the T-matrix amplitudes.
- <sup>3</sup> See HOEHLER 93 for a detailed discussion of the evidence for and the pole parameters of  $N$  and  $\Delta$  resonances as determined from Argand diagrams of  $\pi N$  elastic partial-wave amplitudes and from plots of the speeds with which the amplitudes traverse the diagrams.
- <sup>4</sup> LONGACRE 78 values are from a search for poles in the unitarized T-matrix. The first (second) value uses, in addition to  $\pi N \rightarrow N\pi\pi$  data, elastic amplitudes from a Saclay (CERN) partial-wave analysis.

## N(1720) REFERENCES

For early references, see Physics Letters **111B** 1 (1982).

ANISOVICH	12A	EPJ A48 15	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)	REFID=54041
SHRESTHA	12A	PR C86 055203	M. Shrestha, D.M. Manley	(KSU)	REFID=54862
WORKMAN	12A	PR C86 015202	R. Workman <i>et al.</i>	(GWU)	REFID=54335
ANISOVICH	10	EPJ A44 203	A.V. Anisovich <i>et al.</i>	(BONN, PNPI)	REFID=53280
BATINIC	10	PR C82 038203	M. Batinic <i>et al.</i>	(ZAGR)	REFID=53552
THOMA	08	PL B659 87	U. Thoma <i>et al.</i>	(CB-ELSA Collab.)	REFID=52087
DRECHSEL	07	EPJ A34 69	D. Drechsel, S.S. Kamalov, L. Tiator	(MAINZ, JINR)	REFID=52105
DUGGER	07	PR C76 025211	M. Dugger <i>et al.</i>	(Jefferson Lab CLAS Collab.)	REFID=52039
ARNDT	06	PR C74 045205	R.A. Arndt <i>et al.</i>	(GWU)	REFID=51535
PDG	06	JPG 33 1	W.-M. Yao <i>et al.</i>	(PDG Collab.)	REFID=51004
SHKLYAR	05	PR C72 015210	V. Shklyar, H. Lenske, U. Mosel	(GIES)	REFID=50977
ARNDT	04	PR C69 035213	R.A. Arndt <i>et al.</i>	(GWU, TRIU)	REFID=49947
PENNER	02C	PR C66 055211	G. Penner, U. Mosel	(GIES)	REFID=49129
PENNER	02D	PR C66 055212	G. Penner, U. Mosel	(GIES)	REFID=49130
VRANA	00	PRPL 328 181	T.P. Vrana, S.A. Dytmann,, T.-S.H. Lee	(PITT+)	REFID=47593
ARNDT	96	PR C53 430	R.A. Arndt, I.I. Strakovsky, R.L. Workman	(VPI)	REFID=44675
ARNDT	95	PR C52 2120	R.A. Arndt <i>et al.</i>	(VPI, BRCO)	REFID=44535
HOEHLER	93	$\pi N$ Newsletter 9 1	G. Hohler	(KARL)	REFID=43821
LI	93	PR C47 2759	Z.J. Li <i>et al.</i>	(VPI)	REFID=43327
MANLEY	92	PR D45 4002	D.M. Manley, E.M. Saleski	(KSA) IJP	REFID=41535
Also		PR D30 904	D.M. Manley <i>et al.</i>	(VPI)	REFID=30071
ARNDT	91	PR D43 2131	R.A. Arndt <i>et al.</i>	(VPI, TELE) IJP	REFID=41467
WORKMAN	90	PR C42 781	R.L. Workman	(VPI)	REFID=43685
TANABE	89	PR C39 741	H. Tanabe, M. Kohno, C. Bennhold	(MANZ)	REFID=40997
Also		NC 102A 193	M. Kohno, H. Tanabe, C. Bennhold	(MANZ)	REFID=40998
BELL	83	NP B222 389	K.W. Bell <i>et al.</i>	(RL) IJP	REFID=30409
CRAWFORD	83	NP B211 1	R.L. Crawford, W.T. Morton	(GLAS)	REFID=30070
PDG	82	PL 111B 1	M. Roos <i>et al.</i>	(HELS, CIT, CERN)	REFID=41167
AWAJI	81	Bonn Conf. 352	N. Awaji, R. Kajikawa	(NAGO)	REFID=30067
Also		NP B197 365	K. Fujii <i>et al.</i>	(NAGO)	REFID=30068
CUTKOSKY	80	Toronto Conf. 19	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP	REFID=30064
Also		PR D20 2839	R.E. Cutkosky <i>et al.</i>	(CMU, LBL) IJP	REFID=40096
SAXON	80	NP B162 522	D.H. Saxon <i>et al.</i>	(RHEL, BRIS) IJP	REFID=30404
HOEHLER	79	PDAT 12-1	G. Hohler <i>et al.</i>	(KARLT) IJP	REFID=30058
Also		Toronto Conf. 3	R. Koch	(KARLT) IJP	REFID=30859
LONGACRE	78	PR D17 1795	R.S. Longacre <i>et al.</i>	(LBL, SLAC)	REFID=30054
LONGACRE	77	NP B122 493	R.S. Longacre, J. Dolbeau	(SACL) IJP	REFID=30051
Also		NP B108 365	J. Dolbeau <i>et al.</i>	(SACL) IJP	REFID=30052
LONGACRE	75	PL 55B 415	R.S. Longacre <i>et al.</i>	(LBL, SLAC) IJP	REFID=30047

NODE=B015

NODE=B015;LINKAGE=L7

NODE=B015;LINKAGE=L5

NODE=B010;LINKAGE=H9

NODE=B015;LINKAGE=L8

NODE=B015

NODE=B015